

# Monitoring Relays 1-Phase AC/DC Over Current Types DIA01, PIA01

CARLO GAVAZZI



DIA01



PIA01

- AC/DC over current monitoring relay
- Current measured through internal shunt
- Measuring range 0.5 to 5 A AC/DC
- Adjustable current limit on relative scale
- Adjustable hysteresis
- Programmable latching at set level
- Output: 8 A SPDT relay normally de-energized
- For mounting on DIN-rail in accordance with DIN/EN 50 022 (DIA01) or plug-in module (PIA01)
- 22.5 mm Euronorm housing (DIA01) or 36 mm plug-in module (PIA01)
- LED indication for relay and power supply ON
- Galvanically separated power supply

## Product Description

DIA01 and PIA01 are precise AC/DC over current monitoring relays. Direct measuring or through current transformer. Owing to the built-in latch function, the ON-position of the relay output can be

maintained. The red LED indicates the relay status. Through the built-in shunt it is possible to monitor loads up to 5 A AC/DC.

## Ordering Key

**DIA 01 C B23 5A**

Housing	_____
Function	_____
Type	_____
Item number	_____
Output	_____
Power supply	_____
Range	_____

## Type Selection

Mounting	Output	Supply: 24 to 48 VAC/DC	Supply: 115/230 VAC
DIN-rail	SPDT	DIA 01 C D48 5A	DIA 01 C B23 5A
Plug-in	SPDT	PIA 01 C D48 5A	PIA 01 C B23 5A

## Input Specifications

<b>Input</b> (current level)	Terminals Y1, Y2 Terminals 5, 7	
<b>Measuring ranges</b>	<b>Internal resist.</b>	<b>Max. curr.</b>
Direct	0.05 Ω	6 A
..5A: 0.5 to 5 A AC/DC		25 A
Max. current for 1 s	<b>AAC<sub>rms</sub></b>	<b>Max. curr.</b>
Standard CT (examples)	5 to 50 A	60 A
TADK2 50 A/5 A	15 to 150 A	180 A
CTD1 150 A/5 A	40 to 400 A	480 A
CTD4 400 A/5 A	100 to 1000 A	1200 A
TAD12 1000 A/5 A	600 to 6000 A	7200 A
TACO200 6000 A/5 A		
<b>Contact input</b>	Terminals Z1, Y1 Terminals 8, 9	
DIA01	> 10 kΩ	
PIA01	< 500 Ω	
Disabled	> 500 ms	
Enabled		
Latch disable		
<b>Note:</b>	The input voltage cannot raise over 300 VAC/DC with respect to ground (PIA only)	

## Output Specifications

<b>Output</b>	SPDT relay
<b>Rated insulation voltage</b>	250 VAC
<b>Contact ratings (AgSnO<sub>2</sub>)</b>	μ
Resistive loads	AC 1 8 A @ 250 VAC DC 12 5 A @ 24 VDC
Small inductive loads	AC 15 2.5 A @ 250 VAC DC 13 2.5 A @ 24 VDC
<b>Mechanical life</b>	≥ 30 x 10 <sup>6</sup> operations
<b>Electrical life</b>	≥ 10 <sup>5</sup> operations (at 8 A, 250 V, cos φ = 1)
<b>Operating frequency</b>	≤ 7200 operations/h
<b>Dielectric strength</b>	
Dielectric voltage	≥ 2 kVAC (rms)
Rated impulse withstand volt.	4 kV (1.2/50 μs)

## Supply Specifications

<b>Power supply</b> Rated operational voltage through terminals: A1, A2 or A3, A2 (DIA01) 2, 10 or 11, 10 (PIA01)	Overvoltage cat. III (IEC 60664, IEC 60038)	
D48:	24 to 48 VAC/DC $\pm$ 15% 45 to 65 Hz, insulated	
B23:	115/230 VAC $\pm$ 15% 45 to 65 Hz, insulated	
<b>Dielectric voltage</b> Supply to input Supply to output Input to output	<b>DC supply</b> 2 kV 4 kV 4 kV	<b>AC supply</b> 4 kV 4 kV 4 kV
<b>Rated operational power</b> AC DC	4 VA 2 W	

## General Specifications

<b>Reaction time</b>  Alarm ON delay Alarm OFF delay	(input signal variation from -20% to +20% or from +20% to -20% of set value)  < 100 ms < 300 ms	
<b>Accuracy</b> Temperature drift Repeatability	(15 min warm-up time) $\pm$ 1000 ppm/ $^{\circ}$ C $\pm$ 0.5% on full-scale	
<b>Indication for</b> Power supply ON Output relay ON	LED, green LED, red	
<b>Environment</b> Degree of protection Pollution degree Operating temperature Storage temperature	(EN 60529) IP 20 3 (DIA01), 2 (PIA01) -20 to 60 $^{\circ}$ C, R.H. < 95% -30 to 80 $^{\circ}$ C, R.H. < 95%	
<b>Housing</b> Dimensions	DIA01 PIA01	22.5 x 80 x 99.5 mm 36 x 80 x 94 mm
<b>Weight</b>	Approx. 150 g	
<b>Screw terminals</b> Tightening torque	Max. 0.5 Nm acc. to IEC 60947	
<b>Approvals</b>	UL, CSA	
<b>CE Marking</b>	Yes	
<b>EMC</b> Immunity Emission	Electromagnetic Compatibility According to EN 61000-6-2 According to EN 61000-6-3	

## Mode of Operation

DIA01 and PIA01 monitor both AC and DC over current through an internal shunt. They can monitor AC currents up to 6000 A when connected to a suitable current transformer.

**Example 1**  
(connection between terminals Z1, Y1 or 8, 9 - latch function enabled)

The relay operates and latches in operating position when the measured value exceeds the set level. Provided that the current has dropped min. 4% below the set point (see hysteresis) the relay releases when the inter-

connection between terminals Z1, Y1 or 8, 9 is interrupted or the power supply is interrupted as well.

**Example 2 (Standard CT)**  
(no connection between terminals Z1, Y1 or 8, 9 - latch function disabled)

The relay operates when the current flowing through the transformer exceeds the set level. It releases when the current drops min. 4% below the set level (see hysteresis) or when the power supply is interrupted.

## Range Setting

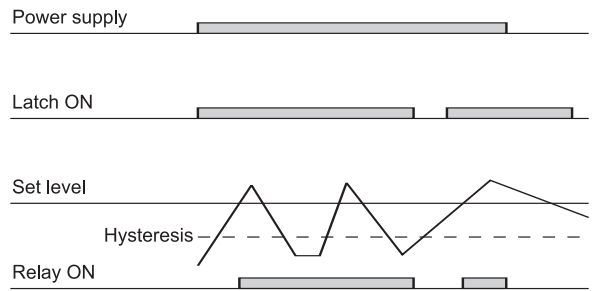
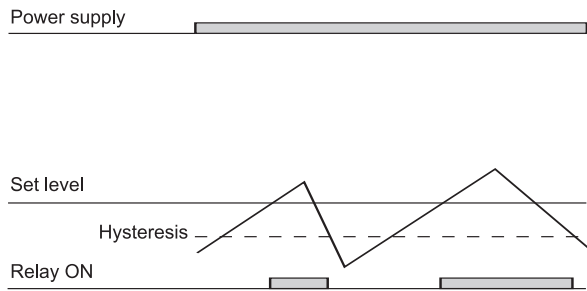
**Centre knob:**  
Setting of current on relative scale: from 10 to 110% of the full-scale value.

**Hysteresis:**  
Approx. 4% of set value, it can be extended by inserting a resistor between terminals Z1, Y1 or 8, 9.

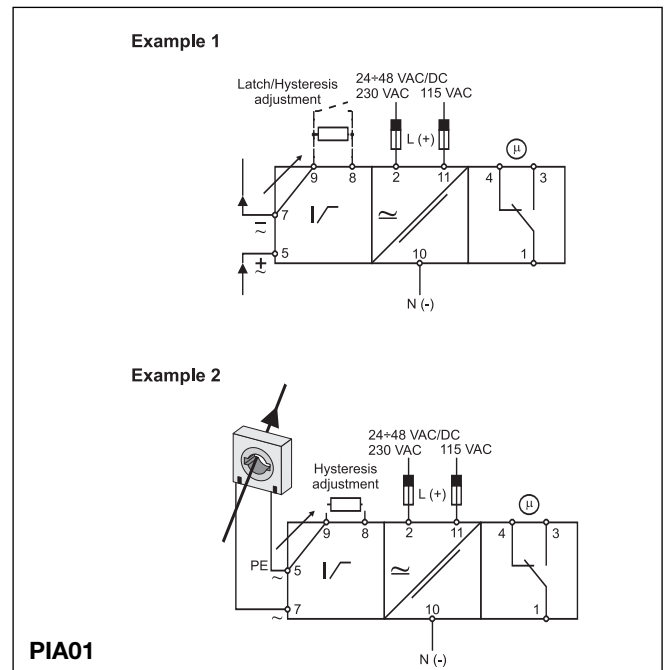
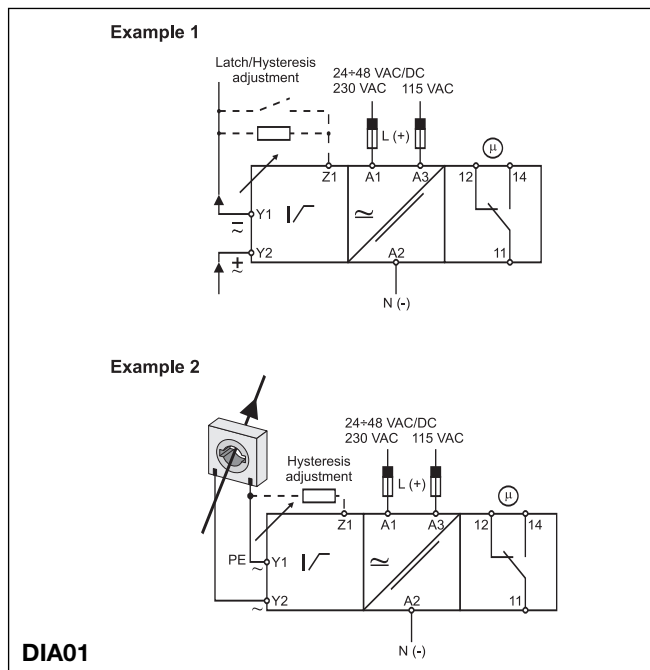
**Approx. resistor values:**

10%: 180 k $\Omega$   
25%: 47 k $\Omega$   
50%: 22 k $\Omega$   
75%: 15 k $\Omega$   
Latch: < 500  $\Omega$

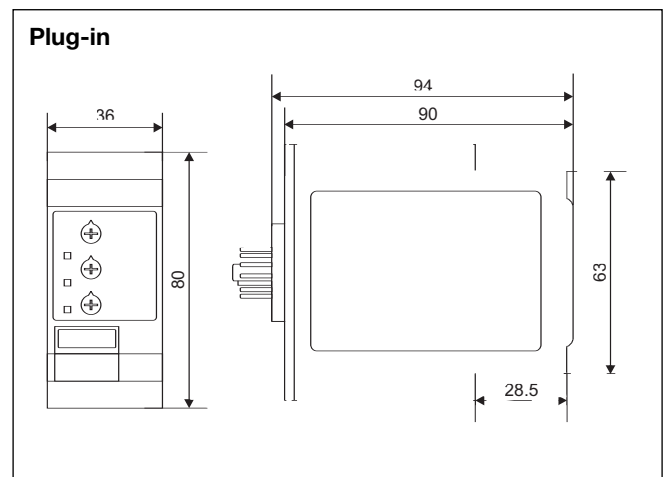
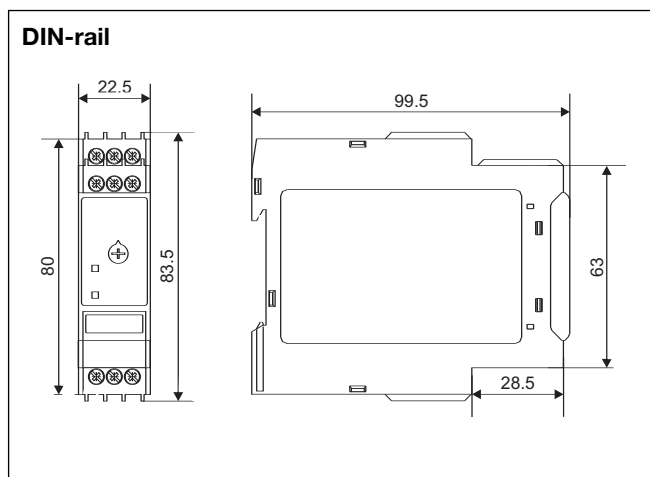
## Operation Diagrams



## Wiring Diagrams



## Dimensions



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